

What is claimed is:

- 1           1.       A modular backplane for an industrial computer comprising:  
2               a first modular backplane segment having a first front side and a first back side,  
3               the first front side including a plurality of slots and the first back side including a first  
4               dedicated connector;  
5               a second modular backplane segment having a second front side and a second  
6               back side, the second front side including a plurality of slots and the second back side  
7               including a second dedicated connector; and  
8               a bridge module having two connectors, one of which is engaged with the first  
9               dedicated connector and the other is engaged with the second dedicated connector,  
10              thereby communicatively connecting the first and second modular backplane segments.
- 1           2.       A modular backplane for an industrial computer according to claim 1,  
2               wherein the bridge module further comprises a circuit board and a bridging integrated  
3               circuit.
- 1           3.       A modular backplane for an industrial computer according to claim 1,  
2               wherein the height of the bridge module is less than that of the slot.
- 1           4.       A modular backplane for an industrial computer according to claim 3,  
2               wherein the height of the bridge module is less than 16 mm.

1           5.       A modular backplane for an industrial computer according to claim 1,  
2       wherein the width of the bridge module is less than 12HP.

1           6.       A modular backplane for an industrial computer according to claim 1,  
2       wherein the length of the bridge module is less than 94 mm.

1           7.       A modular backplane for an industrial computer according to claim 1,  
2       wherein the first and second dedicated connectors are provided in an area where no slot  
3       is formed.

1           8.       A modular backplane for an industrial computer according to claim 7,  
2       wherein the first dedicated connector is disposed in an area between a right-most pair of  
3       slots in the front side of the first backplane segment, and the second dedicated connector  
4       is disposed in an area between a left-most pair of slots in the front side of the second  
5       backplane segment, and vice versa.

1           9.       A modular backplane for an industrial computer according to claim 1,  
2       wherein the first back side and the second back side each further include a plurality of  
3       slots.

1           10.      A modular backplane for an industrial computer according to claim 9,  
2       wherein the slots include J3, J4 and J5 connectors.

1           11.      A modular backplane for an industrial computer according to claim 9,  
2       wherein the slots may provide for the insertion of add-in cards.

1           12.      A modular backplane for an industrial computer according to claim 1,  
2       wherein the slots include J1, J2, J3, J4 and J5 connectors.

1           13.     A module backplane for an industrial computer according to claim 1, wherein  
2           the slots in the first front side provide for the insertion of a system slot board and a  
3           plurality of peripheral boards and all of the slots in the second front side for the insertion  
4           of a plurality of peripheral boards, and vice versa.

1           14.     A modular backplane for an industrial computer according to claim 1,  
2           wherein the first front side and the second front side each include seven slots.

1           15.     A modular backplane for an industrial computer comprising:

2                 a plurality of modular backplane segments, each modular backplane segment  
3           including a front side and a back side, in which the front side has a plurality of slots and  
4           the back side has a primary dedicated connector and a secondary dedicated connector;  
5           and

6                 a plurality of bridge modules for connecting the modular backplane segments,  
7           each bridge module having a pair of connectors, one of which is engaged with the primary  
8           dedicated connector in one of the backplane segments while the other connector is engaged  
9           with the secondary dedicated connector in its neighboring segments, and vice versa, such  
10          that all the modular backplane segments are communicatively connected with another.

1           16.     A modular backplane for an industrial computer according to claim 15,  
2           wherein the bridge module further comprises a circuit board and a bridging integrated  
3           circuit.

1           17.     A modular backplane for an industrial computer according to claim 15,  
2           wherein the height of the bridge module is less than that of the slot.

1           18.     A modular backplane for an industrial computer according to claim 17,  
2           wherein the height of the bridge module is less than 16 mm.

1           19.     A modular backplane for an industrial computer according to claim 15,  
2           wherein the width of the bridge module is less than 12HP.

1           20.     A modular backplane for an industrial computer according to claim 15,  
2           wherein the length of the bridge module is less than 94 mm.

1           21.     A modular backplane for an industrial computer according to claim 15,  
2           wherein the dedicated connectors are provided in an area where no slot is formed.

1           22.     A modular backplane for an industrial computer according to claim 21,  
2           wherein the primary and secondary dedicated connectors are provided in areas between  
3           a left-most slots and a right-most pair of slots, respectively, in the front side of the  
4           backplane segment, and vice versa.

1           23.     A modular backplane for an industrial computer according to claim 15,  
2           wherein the back side further includes a plurality of slots.

1           24.     A modular backplane for an industrial computer according to claim 23,  
2           wherein the slots include J3, J4 and J5 connectors.

1           25.     A modular backplane for an industrial computer according to claim 23,  
2           wherein the slots may provide for insertion of add-in cards.

1           26.     A modular backplane for an industrial computer according to claim 15,  
2           wherein the slots include J1, J2, J3, J4 and J5 connectors.

1           27.     A module backplane for an industrial computer according to claim 15,  
2           wherein the slots in the front side of one of the backplane segments provide for the  
3           insertion of a system slot board and a plurality of peripheral boards and all of the slots  
4           in the front side of the remaining backplane segments for the insertion of a plurality of  
5           peripheral boards.

1           28.     A modular backplane for an industrial computer according to claim 15,  
2           wherein the front side includes seven slots.

1           29.     A monolithic backplane for an industrial computer comprising:  
  
2                 a first modular backplane segment having a first front side and a first back side,  
3           the first front side including a plurality of slots and the first back side including a first  
4           dedicated connector;

5                 a second modular backplane segment having a second front side and a second  
6           back side, the second front side including a plurality of slots and the second back side  
7           including a second dedicated connector; and

8                 a bridge module having two connectors, one of which is engaged with the first  
9           dedicated connector and the other is engaged with the second dedicated connector,  
10          thereby communicatively connecting the first and second modular backplane segments